

CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1. A distributed method for processing auction traffic using one or more servers at a plurality of nodes in a distributed processing system comprising the steps of:
- using a current local winner determination method at each of the nodes to quickly identify loser bids and candidate winning bids; and
 - using a current global winner determination method to determine from the candidate winning bids from each of nodes a current set of winners.
2. The method of claim 1, wherein the auction is an open-cry auction.
3. The method of claim 2, wherein the current local winner determination method comprises the steps of:
- receiving a new bid(v, q) at a node, where v denotes the price per unit and q denotes the quantity desired;
 - checking to see if the new bid ranks in the top $\lfloor N/q \rfloor$ bids, in terms of price/unit bid value, amongst all the bids asking for quantity q whose information is available to this process, where $\lfloor x \rfloor$ stands for the greatest integer less than or equal to x ;
 - taking the new bid along with the set of $\lfloor N/q \rfloor$ bids that have been processed and determining a new set of top $\lfloor N/q \rfloor$ bids;
 - determining if bid(v, q) is in the top $\lfloor N/q \rfloor$ bids and, if it is not, declaring it a loser bid, but if so, declaring it a candidate bid.

1 4. The method of claim 3, further comprising the steps of:
2 holding the candidate bid at the node for a time, τ ; and
3 if by time τ , through an arrival of another bid, a candidate bid loses its
4 position amongst the top $\lfloor N/q \rfloor$ highest bids, declaring the bid a loser bid;
5 otherwise, declaring the bid a winner candidate and making the bid
6 accessible for further processing by the current global winner determination
7 method.

1 5. The method of claim 4, wherein the current global winner determination
2 method comprises the steps of:
3 receiving new candidate winning bid from a node $\text{bid}(v, q)$;
4 taking the candidate winning bid along with the set of all bids that
5 have been processed and determines a new set of winners;
6 determining whether the new candidate $\text{bid}(v, q)$ is a winner or a loser;
7 and
8 notifying the bidder of $\text{bid}(v, q)$ as to whether they are a winner or
9 loser.

1 6. The method of claim 2, wherein the current local winner determination
2 method comprises the steps of:
3 receiving a new bid $\text{bid}(v, q)$ at a node, where v denotes the price per unit
4 and q denotes the quantity desired;
5 considering a set of bids using a set of pre-specified auction rules and
6 selecting winners for auctioning $N+x$ copies of the item on sale; and
7 determining whether the $\text{bid}(v, q)$ is a candidate winner bid.

1 7. The method of claim 6, wherein the current global winner determination
2 method comprises the steps of:

1 8. The method of claim 1, wherein the auction is a descending auction.

receiving a bid (q) for processing, where q is the quantity desired at
going price p ;

8 if the bid is in the first $\lfloor R/q \rfloor$ bids, asking for quantity q at the going
9 price p , then declaring the bid a candidate winner bid; and

1 10. The method of claim 9, further comprising the steps of:

determining whether the time stamp, if it exists on the bid, is greater than or equal to the time stamp of any bid, asking for quantity q at going price p , that has been processed by the method in the past.

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